

ABSTRACT OF THE DISCLOSURE

Carbon nanotube devices and methods for fabricating these devices, wherein in one embodiment, the fabrication process consists of the following process steps: (1) generation of a template, (2) catalyst deposition, and (3) nanotube synthesis within the template. In another embodiment, a carbon nanotube transistor comprises a carbon nanotube having two or more defects, wherein the defects divide the carbon nanotube into three regions having differing conductivities. The defects may be introduced by varying the diameter of a template in which the carbon nanotube is fabricated and thereby causing pentagon-heptagon pairs which form the defects.

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